
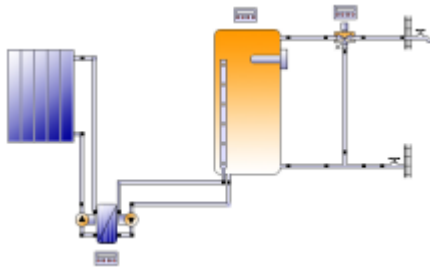


Summary report

	<p>This report has been created by: Jeanette Gretsch SOLARHOT 233-O East Johnson St., 27513 Cary, US</p>
Variant (Hot water)	Project Solvelox
	<p>NC Raleigh Site: Clear Country: USA Longitude: -78.78° Latitude: 35.87° Elevation: 350 ft Average outdoor temperature 59.8 °F Radiation collector fields: 29677 kBtu/Year Collector field (facing south) Orientation: 1° Tilt angle: 45°</p>
	<p>Solar system (predefined Vela Solaris template) SV-DB System</p> <p>Collector area: 52.65705 ft² Total absorber area: 48.825096 ft² Tank volume: Volume: 79.3 gal Auxiliary heating power: Power: 6.83 kBtu/hr Total piping length: Length: 36.089 ft (11 Piping)</p>
Comfort demand	Energy demand covered
Total end energy supplied to the reference system (consumed fuel and electricity from the grid)	-
Total end energy supplied to the system (consumed fuel and electricity from the grid)	1651.7 kBtu/Year
Fraction of solar energy to system (net)	88.2 %
Solar fraction hot water (SF _n Hw)	-
Solar fraction building (SF _n Bd)	-
Max annual fuel savings	-
Max annual energy savings	11514 kBtu: Electric resistance heater element 2
Annual reduction in CO ₂ emissions	3990.5 pound : [Electricity] Electric resistance heater element 2
Total collector field yield	10938 kBtu/Year
Collector field yield relating to gross area	208 kBtu/ft ² /Year
Collector field yield relating to aperture area	224 kBtu/ft ² /Year
Comfort demand	Energy demand covered
User defined components/materials	None. Only Vela Solaris-controlled elements are simulated.
Explanations	http://www.polysun.ch/

System overview

Meteorological data

Properties	Value, unit	Properties	Value, unit
Outdoor temperature	59.8 °F	Outdoor temperature 24-h-mean	59.8 °F
Standard outdoor temperature	12.2 °F	Global irradiance	508.9 kBtu/ft ²
Diffuse irradiance	216.8 kBtu/ft ²	Long wavelength irradiance	918.7 kBtu/ft ²
Wind speed	0.84 ft/s	Air humidity	70 %
Normal direct irradiance	529.2 kBtu/ft ²		

Definition of the consumers

Consumer	Cat. n.	Name	Description	Temperature setting	Energy consumption
Presence	1	always present	Presence days: 365	-	-
Hot water demand	1	Constant	70.3 gal/d	122 °F	9818.9 kBtu/Year

Definition of the solar system

Element	Cat. n.	Name	Properties, Value, unit
Collector North America	9170	2x Solarhot S-SC-126P26	Data Source: SRCC
Pipe 3	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
Pipe 4	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
Pipe 5	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
Pipe 6	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
Pipe 8	29	Copper pipe 12x1	External diameter: 0.47 in, Thickness of insulation: 0.79 in
Pipe 9	29	Copper pipe 12x1	External diameter: 0.47 in, Thickness of insulation: 0.79 in
Pipe 10	29	Copper pipe 12x1	External diameter: 0.47 in, Thickness of insulation: 0.79 in
Pipe 11	29	Copper pipe 12x1	External diameter: 0.47 in, Thickness of insulation: 0.79 in
Pipe 12	29	Copper pipe 12x1	External diameter: 0.47 in, Thickness of insulation: 0.79 in
Pipe 13	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
Pipe 14	32	Copper pipe 22x1	External diameter: 0.87 in, Thickness of insulation: 0.79 in
External heat exchanger	1	Plate heat exchanger, small	Transfer capacity: 5000 W/K, Number of heat exchanger plates: 20
Storage tank 2	565	300l potable water master tank	Volume: 79.3 gal, Thickness of insulation: 3.15 in
Pump controller solar loop			Maximum tank temperature: 194 °F, Cut-in temperature difference: 16 dT(°F), Cut-off temperature difference: 8 dT(°F), Definition flow rate setting: Specific flow rate
Auxiliary heating controller			Reference for temperature sensors 1: Fixed value, Minimum operation time: 0 min, Minimum downtime: 0 min
Mixing valve controller			Definition temperature setting: Fixed value, Temperature shift: 0 dT (°F)

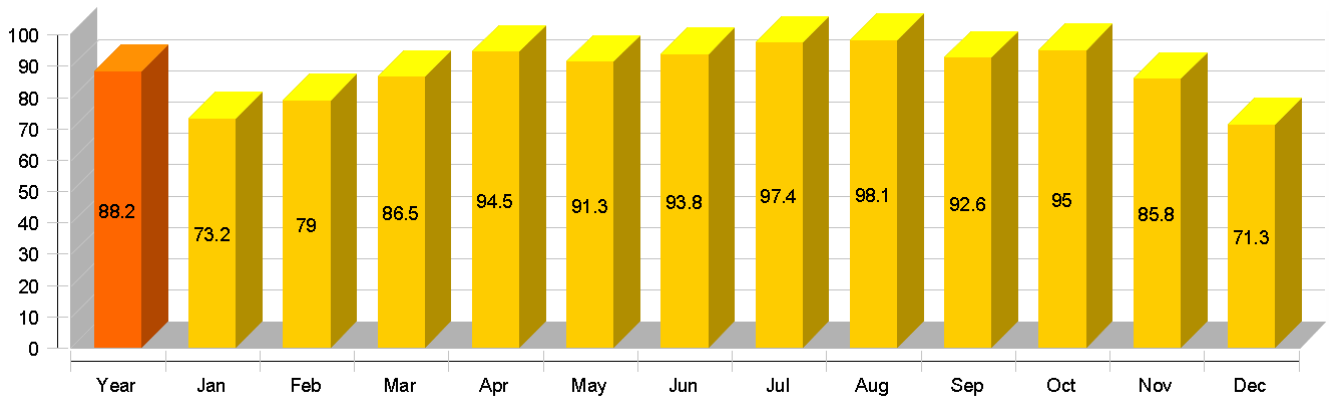
Results overview

Fraction of solar energy to system (net)

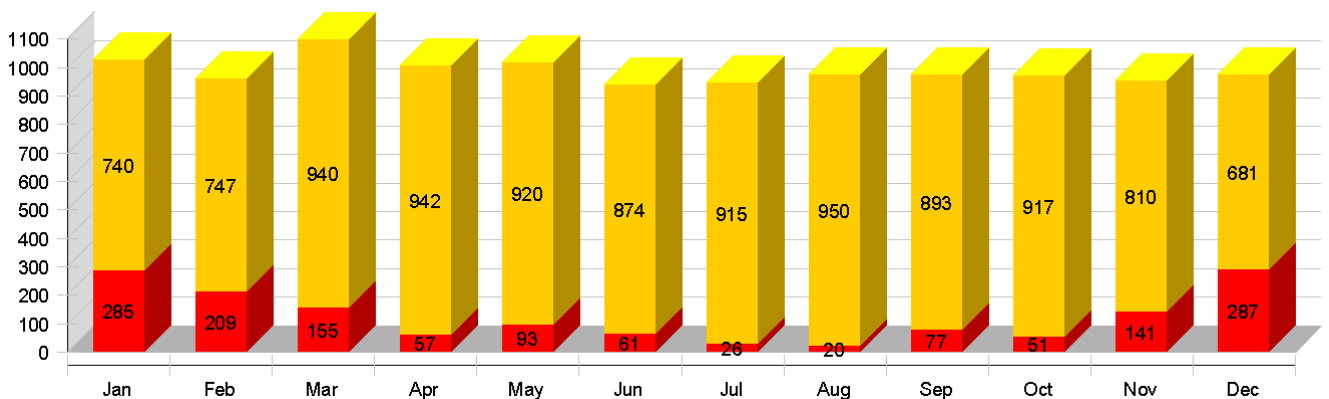
Symbol	Unit	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SFn	%	88.2	73.2	79	86.5	94.5	91.3	93.8	97.4	98.1	92.6	95	85.8	71.3
Qsol	kBtu	10938	776	786	991	991	975	929	974	1012	958	977	854	715
Saux	kBtu	1461	285	209	155	57	93	61	26	20	77	51	141	287
Qdem	kBtu	9819	913	837	913	852	835	763	756	743	731	788	808	880
Qdef	kBtu	335	31	29	29	28	29	29	23	22	25	24	29	36

SFn: Fraction of solar energy to system (net), Qsol: Solar energy to the system, Saux: Auxiliary energy in tank, Qdem: Energy demand, Qdef: Energy deficit

Fraction of solar energy to system (net) [%]



Solar yield and auxiliary energy [kBtu]



Daily maximum collector temperature [°F]

